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Real Party in Interest

The present application has been assigned to Applied Materials, Inc., 3050 Bowers Avenue, Santa Clara, California 95054.

Related Appeals and Interferences

Applicant asserts that no other appeals or interferences are known to the Applicant, the Applicant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

Status of Claims

Claims 1-11 are pending in the application. Claims 1-29 were originally presented in the application. Claims 12-29 were withdrawn from consideration by the Examiner in an Office Action dated June 27, 2007. Claims 12-29 were canceled in Applicant's Response to Final Office Action filed November 5, 2007. Claims 1-11 stand finally rejected as discussed below. The final rejection of claims 1-11 are appealed. The pending claims are shown in the attached Claims Appendix.

Status of Amendments

All claim amendments have been entered by the Examiner and are reflected in the listing of claims included in the Claims Appendix.

Summary of Claimed Subject Matter

Claimed embodiments of the invention provide a chamber for cleaning a substrate bevel after a processing step has been conducted on the substrate (p. 2, paragraph [0002], lines 1-3; p. 5, paragraph [0011], lines 1-2).

In the embodiments of independent claim 1, a substrate bevel cleaning chamber (p. 12, paragraph [0031], lines 1-2; Fig. 4, item 400), comprising a chamber body defining a processing volume (p. 12, paragraph [0031], lines 8-10; Fig. 4, items 401, 402); a rotatable substrate support member positioned in a lower portion of the processing volume (p. 12, paragraph [0032], lines 1-3; Fig. 4, item 403); at least three cooperatively rotatable substrate centering posts (p. 16, paragraph [0038], lines 1-14; p. 17, paragraph [0038], lines 1-2; Fig. 4, item 404; Fig. 6) radially positioned around the rotatable substrate support member (p. 14, paragraph [0034], lines 1-4; Fig. 4) such that the posts remain stationary during rotation of the substrate support member (p. 21, paragraph [0048], lines 1-10; Figs. 4-6); and a fluid dispensing nozzle movably positioned to dispense a cleaning fluid onto the top surface of a substrate positioned on the substrate support member (p. 14, paragraph [0034], lines 12-19; Fig. 4, item 405) is provided.

Grounds of Rejection to be Reviewed on Appeal

1. Claims 1 and 6-8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,537,416 to *Mayer et al.* in view of U.S. Patent No. 5,851,041 to *Anderson et al.*

2. Claims 2, 3-5, and 9-10 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,537,416 to *Mayer et al.* in view of U.S. Patent No. 5,851,041 to *Anderson et al.* as applied to claim 1, and further in view of U.S. Publ. No. 2002/0134512 to *Adachi et al.*

3. Claim 11 stands rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,537,416 to *Mayer et al.* in view of U.S. Patent No. 5,851,041 to *Anderson et al.* as applied to claim 1, and further in view of U.S. Patent No. 5,820,685 to *Kurihara et al.*

ARGUMENTS

A. Claims 1 and 6-8 are not obvious over U.S. Patent No. 6,537,416 to *Mayer et al.* in view of U.S. Patent No. 5,851,041 to *Anderson et al.*

Claims 1 and 6-8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,537,416 to *Mayer et al.* in view of U.S. Patent No. 5,851,041 to *Anderson et al.* Applicant respectfully traverses the rejection.

Mayer et al. teach a module for edge bevel removal and backside wafer etch processes (Col. 5, lines 52-55). The module includes a dispense-arm that functions to hold a dispense nozzle and move the nozzle into a specified location over a wafer during an etching process (Col. 11, lines 26-29; Fig. 3, items 256, 303). The module provides a rotatable wafer chuck having arm members. Each arm member has a clamping cam for aligning and clamping a wafer to the wafer chuck (Col. 3, lines 15-32; Col. 15, lines 1-67; Figs. 5A-6B). *Mayer et al.* fail to teach at least three cooperatively rotatable substrate centering posts radially positioned around a rotatable substrate support member such that the posts remain stationary during rotation of the substrate support member.

Anderson et al. teach a wafer holder mounted on a spindle assembly (Col. 4, lines 21-22). The wafer holder has four L-shaped members that may be cooperatively pivoted to hold a wafer (Col. 4, lines 24-41; Fig. 2). The wafer holder is configured to hold a wafer by its edges via the four L-shaped members during a wafer rotating operation (Col. 1, lines 7-11; Fig. 2). *Anderson et al.* fail to teach at least three cooperatively rotatable substrate centering posts radially positioned during rotation of a substrate support member such that the posts remain stationary during rotation of the substrate support member.

Both *Mayer et al.* and *Anderson et al.* lack rotatable substrate centering posts positioned around a rotatable substrate support member such that the posts remain stationary during rotation of the substrate support member. Therefore, *Mayer et al.* and *Anderson et al.*, alone or in combination, fail to teach, show, suggest, or otherwise make

obvious, a substrate bevel cleaning chamber comprising a chamber body defining a processing volume, a rotatable substrate support member positioned in a lower portion of the processing volume, at least three cooperatively rotatable substrate centering posts radially positioned around the rotatable substrate support member such that the posts remain stationary during rotation of the substrate support member, and a fluid dispensing nozzle movably positioned on the substrate support member as recited in claim 1 and claims 2-11 dependent thereon.

Applicant respectfully requests reversal of the Examiner's rejection.

B. Claims 2, 3-5, and 9-10 are not obvious over U.S. Patent No. 6,537,416 to *Mayer et al.* in view of U.S. Patent No. 5,851,041 to *Anderson et al.* as applied to claim 1, and further in view of U.S. Publ. No. 2002/0134512 to *Adachi et al.*

Claims 2, 3-5, and 9-10 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,537,416 to *Mayer et al.* in view of U.S. Patent No. 5,851,041 to *Anderson et al.* as applied to claim 1, and further in view of U.S. Publ. No. 2002/0134512 to *Adachi et al.* Applicant respectfully traverses the rejection.

Mayer et al. and *Anderson et al.*, alone or in combination, do not teach, show, suggest, or otherwise make obvious, at least three cooperatively rotatable substrate centering posts radially positioned around a rotatable substrate support member such that the posts remain stationary during rotation of the substrate support member. These deficiencies are discussed above with respect to claim 1. *Adachi et al.* does not remedy these deficiencies.

Adachi et al. teach a plurality of pins attached to a rotatable substrate support member for holding the substrate to the rotatable substrate holder during rotation thereof (p. 2, paragraph [0014]; Figs. 4 and 13). *Adachi et al.* also fail to teach at least three cooperatively rotatable substrate centering posts radially positioned around a rotatable substrate support member such that the posts remain stationary during rotation of the substrate support member as recited in claim 1 and claims 2-11 dependent thereon.

Because claim 1 is allowable, Applicant respectfully submits that claims 2, 3-5, and 9-10 are allowable as depending from claim 1. Applicant respectfully requests reversal of the Examiner's rejection.

C. Claim 11 is not obvious over U.S. Patent No. 6,537,416 to *Mayer et al.* in view of U.S. Patent No. 5,851,041 to *Anderson et al.* as applied to claim 1, and further in view of U.S. Patent No. 5,820,685 to *Kurihara et al.*

Claim 11 stands rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,537,416 to *Mayer et al.* in view of U.S. Patent No. 5,851,041 to *Anderson et al.* as applied to claim 1, and further in view of U.S. Patent No. 5,820,685 to *Kurihara et al.* Applicant respectfully traverses the rejection.

Mayer et al. and *Anderson et al.*, alone or in combination, do not teach, show, suggest, or otherwise make obvious, at least three cooperatively rotatable substrate centering posts radially positioned around a rotatable substrate support member such that the posts remain stationary during rotation of the substrate support member. These deficiencies are discussed above with respect to claim 1. *Kurihara et al.* does not remedy these deficiencies.

Kurihara et al. teach a wafer support device that includes lift pins that extend through holes in a susceptor to lift the wafer from or lower the wafer onto the susceptor (Col. 1, lines 53-61; Fig. 2). *Kurihara et al.* also fail to teach or suggest at least three cooperatively rotatable substrate centering posts radially positioned around a rotatable substrate support member such that the posts remain stationary during rotation of the substrate support member as recited in claim 1 and claim 11 dependent thereon.

Because claim 1 is allowable, Applicant respectfully submits that claim 11 is allowable as depending from claim 1. Applicant respectfully requests reversal of the Examiner's rejection.

CONCLUSION

The Examiner errs in finding that *Mayer et al.*, *Anderson et al.*, *Adachi et al.*, and *Kurihara et al.*, render claims 1-11 obvious. Applicant respectfully requests that the Examiner's rejections be reversed.

Respectfully submitted,



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CLAIMS APPENDIX

1. (Previously Presented) A substrate bevel cleaning chamber, comprising:
 - a chamber body defining a processing volume;
 - a rotatable substrate support member positioned in a lower portion of the processing volume;
 - at least three cooperatively rotatable substrate centering posts radially positioned around the rotatable substrate support member such that the posts remain stationary during rotation of the substrate support member; and
 - a fluid dispensing nozzle movably positioned to dispense a cleaning fluid onto the top surface of a substrate positioned on the substrate support member.
2. (Original) The cleaning chamber of claim 1, wherein the at least three cooperatively rotatable centering posts comprise:
 - a vertically positioned shaft member;
 - a cap member positioned on a distal terminating end of the shaft member;
 - a raised central substrate support portion positioned at a rotational center of the cap member; and
 - a substrate centering member extending upward from the cap member and being positioned away from the rotational center of the cap member.
3. (Original) The cleaning chamber of claim 2, further comprising a substrate centering actuation mechanism, comprising:
 - at least three rotatable centering post receiving receptacles;
 - a linkage assembly connecting each of the at least three rotatable centering post receiving receptacles; and
 - a reduced friction actuator in communication with the linkage.
4. (Original) The cleaning chamber of claim 3, wherein the reduced friction actuator comprises an air actuated piston assembly positioned in a reduced friction cylinder.

5. (Original) The cleaning chamber of claim 3, wherein the linkage assembly is configured to cooperatively rotate the at least three centering post receiving receptacles.

6. (Original) The cleaning chamber of claim 1, wherein the fluid dispensing nozzle comprises a first pivotally mounted fluid dispensing nozzle in fluid communication with an etchant solution source and a second fluid dispensing nozzle in fluid communication with a rinsing solution source.

7. (Previously Presented) The cleaning chamber of claim 1, comprising a backside fluid dispensing nozzle.

8. (Original) The cleaning chamber of claim 7, wherein the backside fluid dispensing nozzle comprises a cleaning solution dispensing nozzle and a rinsing solution dispensing nozzle.

9. (Original) The cleaning chamber of claim 2, wherein the substrate centering members are in communication with an actuator mechanism configured to simultaneously rotate each of the centering members.

10. (Original) The cleaning chamber of claim 3, wherein the reduced friction actuator and the linkage assembly are configured to rotate the substrate centering posts to engage a bevel of a substrate and center the substrate between the respective centering posts.

11. (Original) The cleaning chamber of claim 1, wherein the substrate centering posts are vertically movable between a loading position and a processing position.

12-29. (Canceled)

EVIDENCE APPENDIX

NONE

RELATED PROCEEDINGS APPENDIX

NONE